TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: Ornamental Iron Installer dies when crushed by load that fell off forklift in California

SUMMARY
California FACE Report 99CA002

A 37-year old male ornamental iron installer leadman (decedent) died when he fell off the forks of a forklift and was crushed by its falling load. He and his co-workers were installing iron fencing sections that were eight feet high by ten feet long. They weighed two hundred and fifteen pounds each. In order to move the last five panels to be installed, they were loaded onto a forklift. The decedent was riding on the forks attempting to steady the load of iron fencing. When the forklift attempted to negotiate a muddy area the wheels sank and the forklift stopped abruptly. The decedent was thrown forward into a sitting position. The iron fencing was also thrown forward, striking him on the head and crushing him to the ground. The load was not secured to the forklift. The driver of the forklift was not trained in its operation. The employer's written Injury and Illness Program was not complete. The CA/FACE investigator determined that, in order to prevent future occurrences, employers should as part of their Injury and Illness Prevention Program (IIPP):

- ensure employees do not ride on the forks of forklifts.
- ensure employees are formally trained in the use of forklifts prior to being allowed to operate them.
- ensure unstable or precarious loads are secured to forklifts before transporting them.
- ensure employees do not drive forklifts over muddy or soft areas unless those areas are bridged or covered**.**
- develop a complete Injury and Illness Prevention Program.

INTRODUCTION

On March 18, 1999 at 2:43 p.m. a 38-year-old male ornamental iron installer leadman was fatally crushed by iron fencing panels. The decedent was riding the forks of a forklift steadying the panels when its front wheels became lodged in the mud. The forklift stopped abruptly, throwing the decedent onto the ground. The fence panels fell on top of him. The CA/FACE investigator learned of this incident on March 26, 1999 from the local legal office of the California Department of Industrial Relations, Division of Occupational Safety & Health (Cal/OSHA). On March 30, 1999 the CA/FACE investigator traveled to the incident site where he met with and interviewed the company co-owner and Chief Executive Officer (CEO). The CA/FACE investigator took photographs of the site and the forklift involved in the incident.

The employer, a metal fabrication and installation company, had been in business for 1 year and 8 months at the time of the incident, but had been in business for 35 years prior to the incident under a different company name. The number of employees in the company is 40 with 8 employees working on site at the time of the incident. The decedent had worked for the company for 13 years and 6 months at the time of the incident. The decedent had worked on and off at the site, and had most recently worked at the site for two days on the fencing project.

The company had some written safety documents and training documents, but did not have a complet**e** Injury and Illness Prevention Program. According to documents provided by the employer, dated October 13, 1996, the decedent was trained in the operating rules of the particular type of forklift involved in this incident. The forklift driver, a co-worker, had not been trained in forklift operation or operating rules. Regularly scheduled safety meetings occurred monthly.

INVESTIGATION

The site of the incident is a large, mostly vacant lot that was being fenced prior to the construction of buildings. Most of the area had been paved with asphalt. The area where the building was to be constructed had a concrete floor with a number of vertical structural steel beams in place. The lot was surrounded by roads on two sides and vacant, dirt lots on the other two sides.

Prior to the incident, the employees had completed a fence around most of the perimeter of the site. The fence sections, 8 feet high and 10 feet long, consisted of one 3-inch by 3-inch post, a number of 1-inch by 1-inch pickets, and two horizontal members (**exhibit 1**). Each section weighed 215 pounds. After the installation of one section of fence, the next section was blocked in place and the horizontal members welded to the post of the adjacent member. Each fence section was unloaded as needed from a truck parked nearby.

It was difficult to utilize the truck for the delivery of the last 5 or 6 sections of fence because a small, dirt sump was located between the asphalt and the area where the fence sections needed to be installed **(exhibit 2)**. For this reason, the employees decided to place the fence sections on a forklift **(exhibit 3)**. They had to travel out of the yard, along a public street for a

short distance, and then over a dirt lot to reach the installation area.

The five sections were loaded onto the forks of the forklift. Prior to moving the loaded forklift, the two employees involved had a discussion about who should operate the forklift. The decedent insisted that his co-worker operate it, but the co-worker felt uncomfortable because of his lack of training and experience on the forklift. The co-worker finally got into the forklift to drive as the decedent put one foot on each of the forks and his hands on the fence sections to keep them steady as the forklift began to drive away.

A welder, who also worked for the company, saw the decedent riding on the forks of the forklift and stopped his job. He lifted his mask and yelled at the decedent and his co-worker, but they could not hear him. They continued and drove out of the yard, up the street and began to pull into the dirt lot.

The area between the pavement of the street and the dirt lot was wet **(exhibit 4)**. As the forklift began to drive over this area, the front wheels, 25-inches in diameter, of the forklift became stuck in the mud **(exhibit 5)**. The forklift came to an abrupt halt and threw the decedent onto the ground in a sitting position. The five sections of fence were also thrown forward landing on the decedent's head and crushing him to the ground.

The co-worker and other company employees lifted the fence sections off the decedent. At that time emergency services were also called. The employees tried to comfort the decedent and provide first aid. The paramedics arrived at 2:53 p.m. and found the decedent to have no spontaneous respirations or pulse. He was transported to a local hospital where he was pronounced dead at 3:34 p.m.

CAUSE OF DEATH

The death certificate stated the cause of death to be chest injuries due to blunt force trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure employees do not ride on the forks of forklifts.

Discussion: In this incident, the decedent was riding on the forks of the forklift in violation of written company policy. Company policy allows only the seated operator to ride while sitting on the forklift seat. Decals or placards should be placed on each forklift illustrating that the riders are prohibited from riding on forklifts unless properly seated. If the decedent had not ridden on the forks of the forklift, this incident may not have happened. For additional information for safe work practices, see recommendation #5.

Recommendation #2: Employers should ensure employees are formally trained in the use of forklifts prior to being allowed to operate them.

Discussion: The co-worker, who was driving the forklift, had not been trained in the operation of the forklift. Although a formal training program was in place, it was presented

approximately every three months and the co-worker had not yet attended. Unauthorized personnel, those that are not properly trained, should not operate forklifts until training is complete. A card or certificate should be issued to each successful trainee.

Recommendation #3: Employers should ensure unstable or precarious loads are secured to forklifts before transporting them.

Discussion: In this incident, the fence sections were loaded with the 3-inch by 3-inch post down and the exposed ends of the horizontal members up. Loaded in this manner, the load was 10 feet high and eight feet wide. With 5 separate fence sections loaded in this manner, the load would be unstable. The load was balanced when loaded on the forks, but could become unbalanced as the forklift traveled over rough ground due to its inherent harsh ride. In this instance, the load should have been secured to prevent shifting and toppling. The backguard of the forklift could have been used to tie down the fence sections and keep them from moving. If this had been done, the need for the decedent to ride the forks would have been removed and this fatality would not have happened.

Recommendation #4: Employers should ensure employees do not drive forklifts over muddy or soft areas unless those areas are bridged or covered.

Discussion: In this incident, the forklift was driven into soft, muddy soil. When the wheel of the forklift sank into the muddy soil, it came to an abrupt stop. Forklift operators should avoid muddy or soft soil when operating a forklift to protect loads from falling. If an area of mud or soft soil needs to be crossed, a bridge or sturdy covering that can support the forklift and its load should be used. If the muddy culvert the forklift was attempting to cross in this incident was bridged or covered, this incident may not have happened.

Recommendation #5: Employers should develop a formal Injury and Illness Prevention Program.

Discussion: The employer in this incident did not have a formal, organized Injury and Illness Prevention Program (IIPP). Many parts of the program were available as separate documents. To ensure that all employees receive the same safety information and training, it is important to have the IIPP organized into one document. Once a formal IIPP has been established, it must be implemented properly to be effective. All employees must be trained to know and understand its parts. Important in this case is ensuring that employees comply with the safe and healthy work practices. Recognition of safe workers and progressive discipline for safety violations are two methods to ensure compliance. Training for specific tasks, especially if an employee is assigned new responsibilities, is of paramount importance. This employer involved in this incident performed much of their training "on-the-job." A complete, written training program detailing the tasks and the hazards of that job is essential to ensuring all employees get the same, safe training.

References:
For general information regarding forklift operation refer to:
http.www.dir.ca.gov./title8/3650.html; /3664.html

Barclays Official California Code of Regulations, Vol. 9, Title 8, Industrial Relations, South San Francisco, 1998

Essentials of Material Handling, U.S. Department of Labor, Occupational Safety and Health Administration, 1978

Forklift Safety Training, *Professional Safety*, American Society of Safety Engineers, January 1993

The New Professionals, Rules for Safe Industrial Truck Operation, Clark Equipment Company, Battle Creek, MI, 1983

Richard W. Tibben, CSP
FACE Investigator

Robert Harrison, MD, MPH
FACE Project Officer

Laura Styles, MPH
Research Scientist

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Foundation, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in

fatal injury, and the role of management in controlling how these factors interact.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

California FACE Program
California Department of Health Services
Occupational Health Branch
850 Marina Bay Parkway, Building P, Third Floor
Richmond, CA 94804